Weighted Model Counting with Conditional Weights for Bayesian Networks

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Boolean Algebras and Propositional Logic

Let $U = \{a, b\}$. Then 2^{2^U} is a Boolean algebra with the following Hasse diagram ($x \leq y$ if $x \subseteq y$ or, equivalently, $x = x \wedge y$).

Experimental Results

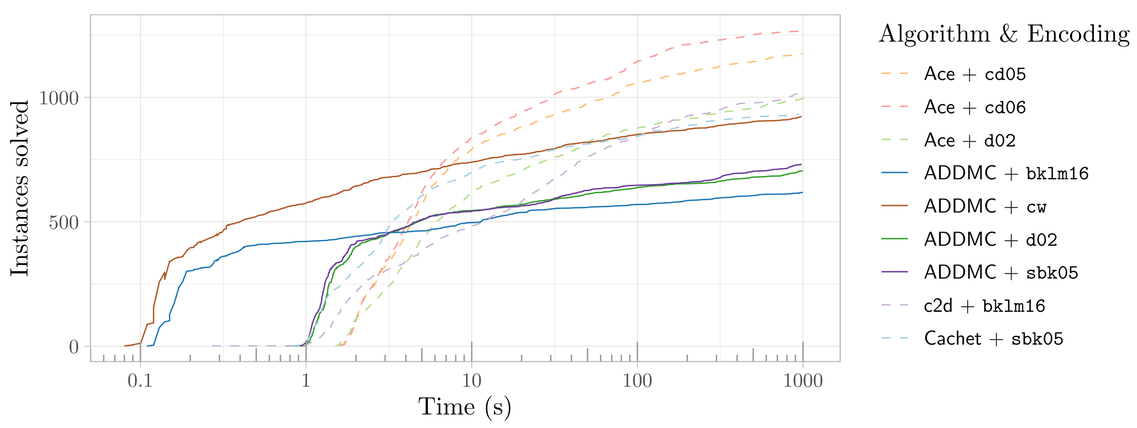

Fig. 1: Cumulative numbers of instances solved by combinations of algorithms and encodings over time.

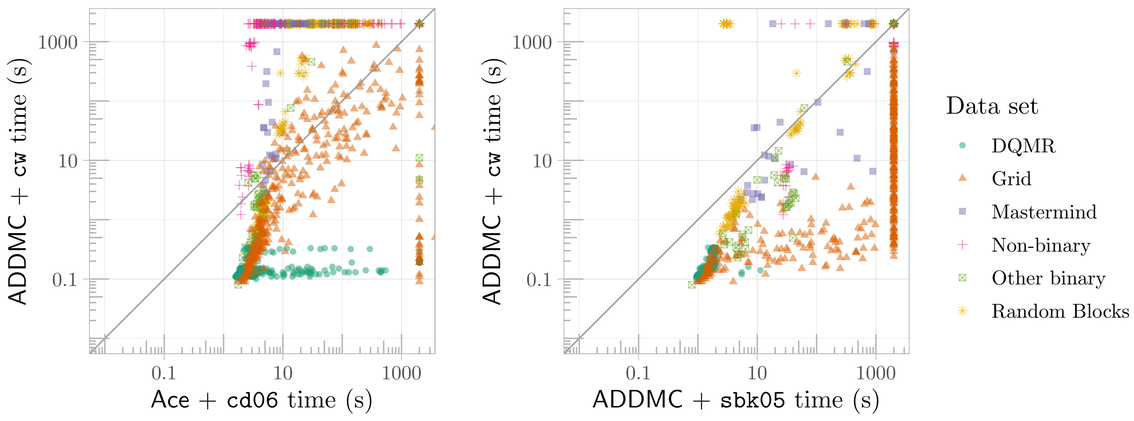

Fig. 2: An instance-by-instance comparison between ADDMC + cw and the best overall combination of algorithm and encoding (Ace + cd06, on the left) as well as the second-best encoding for ADDMC (sbk05, on the right).

TODO

Encoding(s)	Variables	Clauses/ADDs
bklm16, cd05, cd06, sbk05	$O(nv^{d+1})$	$O(nv^{d+1})$
cw	$O(nv)$	$O(nv^2)$
d02	$O(nv^{d+1})$	$O(ndv^{d+1})$

Tab. 1: Asymptotic upper bounds on the numbers of variables and clauses/ADDs for each encoding.